tion to promoters that are known to cause transcription of DNA in plant cells, other promoters may be identified for use in the current invention by screening a plant cDNA library for genes that are selectively or preferably expressed in the target tissues and then determine the promoter regions.

[0119] The term "constitutive promoter" means a regulatory sequence which causes expression of a structural nucleotide sequence in most cells or tissues at most times. Constitutive promoters are active under most environmental conditions and states of development or cell differentiation. A variety of constitutive promoters are well known in the art. Examples of constitutive promoters that are active in plant cells include but are not limited to the nopaline synthase (NOS) promoters; the cauliflower mosaic virus (CaMV) 19S and 35S; the tobacco mosaic virus promoter; the figwort mosaic virus promoters; and actin promoters, such as the *Arabidopsis* actin gene promoter (see, e.g., Huang, Plant Mol. Biol. 33:125-139 (1997)).

[0120] The term "inducible promoter" refers to a regulatory sequence which causes conditional expression of a structural nucleotide sequence under the influence of changing environmental conditions or developmental conditions. Examples of inducible promoters include but are not limited to the light-inducible promoter from the small subunit of ribulose-1,5-bis-phosphate carboxylasc (ssRUBISCO); the drought-inducible promoter of maize (Busk, Plant J. 11:1285-1295 (1997)); the cold, drought, and high salt inducible promoter from potato (Kirch, Plant Mol. Biol. 33:897-909 (1997)); a nitrate-inducible promoter derived from the spinach nitrite reductase gene (Back et al., Plant Mol. Biol. 17:9 (1991)); salicylic acid inducible promoter (Uknes et al., Plant Cell 5:159-169 (1993); Bi et al., Plant J. 8:235-245 (1995)); the auxin-response elements E1 promoter fragment (AuxREs) in the soybean (*Glycine max* L.) (Liu, Plant Physiol. 115:397-407 (1997)); the auxin-responsive *Arabidopsis* GST6 promoter (also responsive to salicylic acid and hydrogen peroxide) (Chen, Plant J. 10: 955-966 (1996)); the auxin-inducible parC promoter from tobacco (Sakai, 37:906-913 (1996)); a plant biotin response element (Streit, Mol. Plant. Microbe Interact. 10:933-937 (1997)); the promoter responsive to the stress honnone abscisic acid (Sheen, Science 274:1900-1902 (1996)); the maize In2-2 promoter activated by benzenesulfonamide herbicide safeners (De Veylder, Plant Cell Physiol. 38:568-577 (1997)); a tetracycline-inducible promoter, such as the promoter for the *Avena sativa* L. (oat) arginine decarboxylase gene (Masgrau, Plant J. 11:465-473 (1997)); and a salicylic acid-responsive element (Stange, Plant J. 11:1315-1324 (1997)).

[0121] The term "tissue-specific promoter" means a regulatory sequence that causes transcriptions or enhanced transcriptions of DNA in specific cells or tissues at specific times during plant development, such as in vegetative tissues or reproductive tissues. Examples of tissue-specific promoters under developmental control include promoters that initiate transcription only (or primarily only) in certain tissues, such as vegetative tissues, e.g., roots, leaves or stems, or reproductive tissues, such as fruit, ovules, seeds, pollen, pistols, flowers, or any embryonic tissue. Reproductive tissue specific promoters may be, e.g., ovule-specific, embryo-specific, endosperm-specific, integument-specific, seed coat-specific, pollen-specific, petal-specific, sepal-specific, or some combination thereof. One of skill will recognize that a tissue-specific promoter may drive expression of operably linked sequences in tissues other than the target tissue. Thus, as used herein a tissue-specific promoter is one that drives expression preferentially in the target tissue, but may also lead to some expression in other tissues as well.

[0122] A variety of promoters specifically active in vegetative tissues, such as leaves, stems, roots and tubers, can also be used to express the nucleic acids of the invention. Examples of tuber-specific promoters include but are not limited to the class I and II patatin promoters (Bevan et al., EMBO J. 8: 1899-1906 (1986); Koster-Topfer et al., *Mol Gen Genet.* 219: 390-396 (1989); Mignery et al., *Gene.* 62: 27-44 (1988); Jefferson et al., *Plant Mol. Biol.* 14: 995-1006 (1990)), the promoter for the potato tuber ADPGPP genes, both the large and small subunits; the sucrose synthase promoter (Salanoubat and Belliard, *Gene.* 60: 47-56 (1987), Salanoubat and Belliard, *Gene.* 84: 181-185 (1989)); and the promoter for the major tuber proteins including the 22 kd protein complexes and proteinase inhibitors (Hannapel, *Plant Physiol.* 101: 703-704 (1993)). Examples of leaf-specific promoters include but are not limited to the ribulose biphosphate carboxylase (RBCS or RuBISCO) promoters (see, e.g., Matsuoka, Plant J. 6:311-319 (1994)); the light harvesting chlorophyll a/b binding protein gene promoter (see, e.g., Shiina, Plant Physiol. 115-477-483 (1997); Casal, Plant Physiol. 116:1533-1538 (1998)); and the *Arabidopsis thaliana* myb-related gene promoter (Atmyb5) (Li, FEBS Lett. 379:117-121 (1996)). Examples of root-specific promoter include but are not limited to the promoter for the acid chitinase gene (Samac et al., *Plant Mol. Biol.* 25: 587-596 (1994)); the root specific subdomains of the CaMV35S promoter that have been identified (Lam et al., *Proc. Natl. Acad. Sci.* (*U.S.A.*) 86:7890-7894 (1989)); the ORF13 promoter from *Agrobacterium* rhizogenes which exhibits high activity in roots (Hansen, Mol. Gen. Genet. 254:337-343 (1997)); the promoter for the tobacco root-specific gene TobRB7 (Yamamoto, Plant Cell 3:371-382 (1991)); and the root cell specific promoters reported by Conkling et al. (Conkling et al., *Plant Physiol.* 93: 1203-1211 (1990)).

[0123] Another class of useful vegetative tissue-specific promoters are meristermatic (root tip and shoot apex) promoters. For example, the "SHOOTMERISTEMLESS" and "SCARECROW" promoters, which are active in the developing shoot or root apical meristems (Di Laurenzio, Cell 86:423-433 (1996); Long, Nature 379:66-69 (1996)), can be used. Another example of a useful promoter is that which controls the expression of 3-hydroxy-3-methylglutaryl coenzyme A reductase HMG2 gene, whose expression is restricted to meristematic and floral (secretory zone of the stigma, mature pollen grains, gynoecium vascular tissue, and fertilized ovules) tissues (see, e.g., Enjuto, Plant Cell. 7:517-527 (1995)). Also another example of a useful promoter is that which controls the expression of knl-related genes from maize and other species which show meristern-specific expression (see, e.g., Granger, Plant Mol. Biol. 31:373-378 (1996); Kerstetter, Plant Cell 6:1877-1887 (1994); Hake, Philos. Trans. R. Soc. Lond. B. Biol. Sci. 350:45-51 (1995). Another example of a meristematic promoter is the *Arabidopsis thaliana* KNAT1 promoter. In the shoot apex, KNAT1 transcript is localized primarily to the shoot apical meristem; the expression of KNAT1 in the shoot meristem decreases during the floral transition and is restricted to the cortex of the inflorescence stem (see, e.g., Lincoln, Plant Cell 6:1859-1876 (1994)).

[0124] Suitable seed-specific promoters can be derived from the following genes: MAC1 from maize (Sheridan,